



March 15, 2013

Test Results of
First Quarter
Chronic 7-Day Renewal
Biomonitoring Testing
for
Outfall 001
Dumas, AR

Control No. 165442-1

Prepared for:

Mr. Bill Miles
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Prepared by:

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McClelland Consulting Engineers, Inc.
ATTN: Mr. Bill Miles
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Little Rock, AR 72203-4087

Re: Chronic 7-Day Renewal utilizing *Pimephales promelas* (Fathead minnow) and *Ceriodaphnia dubia*
Outfall 001 - Dumas, AR
NPDES Permit No. AR

Dear Mr. Bill Miles:

This report is the analytical results and supporting information for the samples submitted to American Interplex Corporation (AIC). The following results are applicable only to the sample identified by the control number referenced above. Accurate assessment of the data requires access to the entire document. Each section of the report has been reviewed and approved by the laboratory director or qualified designee.

Testing procedures and Quality Assurance were in accordance with "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013, Fourth Edition, October 2002. Test results are summarized below:

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The No Observable Effects Concentration (NOEC) for survival occurred at 52 % effluent, which is above the critical dilution of 39 %. The NOEC for growth occurred at 52 % effluent, which is above the critical dilution of 39 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the Fathead minnow test.**

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The No Observable Effects Concentration (NOEC) for survival occurred at 52 % effluent, which is above the critical dilution of 39 %. The NOEC for reproduction occurred at 52 % effluent, which is above the critical dilution of 39 %. **The sample, therefore, PASSED both lethal and sub-lethal effects for the *Ceriodaphnia dubia* test.**

AMERICAN INTERPLEX CORPORATION

John Overbey
Laboratory Director

The signature of John Overbey is written in black ink above a horizontal line. Below the line, his name and title are printed in a standard font.

PDF cc: McClelland Consulting Engineers, Inc.
ATTN: Mr. Bill Miles
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Table of Contents

I. Control Acceptance Criteria

II. Outlined Report

III. Data Analysis

IV. Standard Reference Toxicants

V. Chemical Analysis/Quality Control

VI. Organism History

VII. Results Summary

Pimephales promelas (Fathead minnow)

Ceriodaphnia dubia

Appendix A: Raw Data

A1: Test 1000.0

Pimephales promelas (Fathead minnow) Survival and Growth

Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

A2: Statistics

A3: Water Chemistry

A4: Reference Toxicant

Appendix B: Chains of Custody

I. Control Acceptance Criteria

Pimephales promelas (Fathead minnow) Method 1000.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Growth > or = 0.25 mg per Surviving minnow	0.364	PASS
Control Growth CV < or = 40%	10.1	PASS
Growth Minimum Significant Difference 12 to 30%	13.2	PASS
Critical Dilution CV < or = 40%	9.59	PASS

Ceriodaphnia dubia Method 1002.0

CRITERIA	RESULTS	PASS/FAIL
Control Survival > or = 80%	100	PASS
Control Reproduction > or = 15 per Surviving Female	15.8	PASS
Control CV < or = 40% per Surviving Female	18.6	PASS
Reproduction Minimum Significant Difference 13 to 47%	21.8	PASS
Critical Dilution CV < or = 40%	16.3	PASS

II. Outlined Report

A. Introduction

1. Permit Number: AR
2. Test Requirements: Chronic Biomonitoring, Quarterly Test Methods 1000.0 and 1002.0
3. Receiving Stream:

B. Source of Effluent/Dilution Water

1. Effluent Samples:
 - a. Sampling Point: Outfall 001
 - b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	6.9	8.8	6.8
pH (standard units)	8.0	8.1	7.8
Alkalinity (mg/l as CaCO ₃)	72	71	73
Hardness (mg/l as CaCO ₃)	20	18	18
Conductivity (umhos/cm)	240	190	240
Residual Chlorine (mg/l)	<0.05	0.29	<0.05
Ammonia as N (mg/l)	0.68	0.29	0.34

2. Dilution Water Samples: Synthetic Moderately Hard Water #3965

- a. Dates Prepared: February 24 through March 10, 2013
- b. Chemical Data:

Analysis	Sample 1	Sample 2	Sample 3
Dissolved oxygen (mg/l)	7.8	7.7	7.8
pH (standard units)	8.2	8.0	8.1
Alkalinity (mg/l as CaCO ₃)	61	61	57
Hardness (mg/l as CaCO ₃)	83	80	80
Conductivity (umhos/cm)	280	280	300
Residual Chlorine (mg/l)	<0.05	<0.05	<0.05

C. Test Methods

1. Test methods used:

Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013; test Methods 1000.0 and 1002.0, Fathead Minnow Survival and Growth and *Ceriodaphnia dubia* Survival and Reproduction.

2. Endpoint: No Observable Effects Concentration (NOEC)

3. Test Conditions:

Pimephales promelas (Fathead minnow) Survival and Growth Method 1000.0

Date & Time Test Initiated: March 5, 2013 at 1530
Date & Time Test Terminated: March 12, 2013 at 1330
Type & Volume of Test Chamber: 500 ml disposable beaker
Volume of Sample: 250 ml
Number of Organisms per replicate: 8
Number of Replicates per dilution: 5

Ceriodaphnia dubia Survival and Growth Method 1002.0

Date & Time Test Initiated: March 5, 2013 at 1600
Date & Time Test Terminated: March 12, 2013 at 1515
Type & Volume of Test Chamber: 30 ml disposable beaker
Volume of Sample: 15 ml
Number of Organisms per replicate: 1
Number of Replicates per dilution: 10

4. Acclimation of test organisms: Obtained from in-house cultures

5. Test Temperature: 25 +/- 1 degree Celsius

D. Test Organisms

1. Scientific Name

- a. Test 1000.0 *Pimephales promelas*
- b. Test 1002.0 *Ceriodaphnia dubia*

III. Data Analysis

The data was analyzed using American Interplex Corporation's Laboratory Information Management Software based on Toxstat.

Pimephales promelas (Fathead minnow) survival data was transformed using the Arc Sine transformation. Normality and homogeneity of variance were checked using Shapiro-Wilk's. The survival data was then analyzed using Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC).

Fathead minnow growth data was analyzed for normality and homogeneity of variance using Shapiro-Wilk's and Bartlett's test. Dunnett's Test was used to determine the No Observable Effects Concentration (NOEC) for growth.

Ceriodaphnia dubia survival data was analyzed with Fisher's Exact Test. Reproduction data was analyzed using Kolmogorov's Test for Normality and analyzed with Steel's Many-One Rank Test to determine the No Observable Effects Concentration (NOEC) for Reproduction. Dunnett's Test was used to calculate the PMSD.

IV. Standard Reference Toxicants

American Interplex Corporation has an ongoing test organism culturing program. The sensitivity of the offspring is determined by performing a standard reference toxicant test with each effluent test. Sodium chloride in synthetic moderately hard water is used as prescribed in EPA-821-R-02-013.

Pimephales promelas (Fathead minnow)

Chronic reference tests are performed monthly.

A chronic reference test was performed on February 5, 2013 at 1445 to February 12, 2012 at 1300

The results were as follows: (Control No. 164616-1.)

Survival LC-50: 3823 mg/l

Growth IC-25: 5220 mg/l

Growth PMSD: 15

Ceriodaphnia dubia

Chronic reference tests are performed monthly.

A chronic reference test was performed on February 5, 2013 at 1530 to February 12, 2012 at 1340

The results were as follows: (Control No. 164616-2.)

Survival LC-50: 2125 mg/l

Growth IC-25: 1167 mg/l

Growth PMSD: 9.36

V. Chemical Analysis/Quality Control

Parameter	Method	% Recovery	Relative % Difference
Alkalinity	SM 2320 B	NA	0.00
Hardness	EPA 200.7	100	0.450
pH	SM 4500-H+ B	101	0.133
Conductivity	EPA 120.1	101	0.00

VI. Organism History

Pimephales promelas (Fathead minnow)

Date: March 5, 2013

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

Ceriodaphnia dubia

Date: March 5, 2013

Age: <24 hours

Source: In-house culture

Water Chemistry Record:

Alkalinity: 57-64 mg/l

Hardness: 80-100 mg/l

Temperature: 25 deg.C

VII. Results Summary *Pimephales promelas*, Fathead minnow Larval Survival and Growth Test -- Method 1000.0

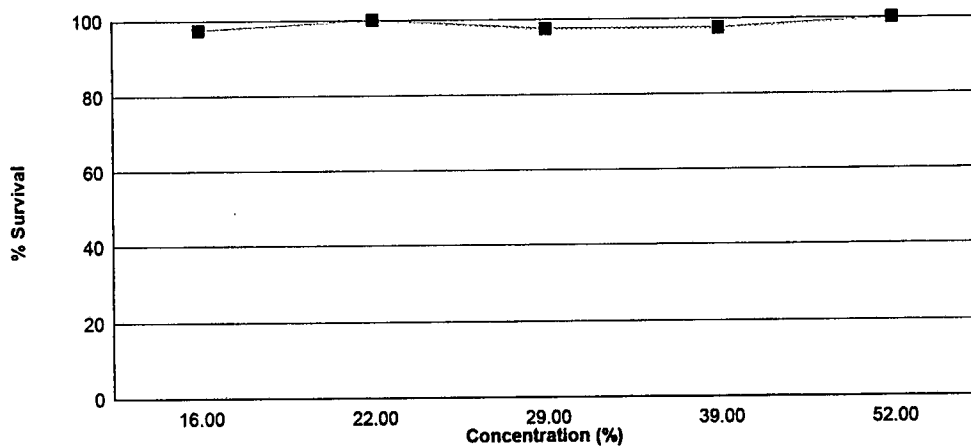
Larvae are exposed in a static renewal system for seven days to different concentrations of effluent with dilution water. Test results are based on the survival and growth (increase in weight) of the larvae.

Effluent dilutions for this test were 16 %, 22 %, 29 %, 39 %, 52 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 39 % effluent.

The test was initiated on March 5, 2013 at 1530 and continued through March 12, 2013 at 1330. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 52 % effluent
- b.) NOEC growth = 52 % effluent



Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.364
16 %	97.5	0.402
22 %	100	0.411
29 %	97.5	0.407
39 %	97.5	0.389
52 %	100	0.408

VII. Results Summary *Ceriodaphnia dubia*, Cladoceran Survival and Reproduction Test -- Method 1002.0

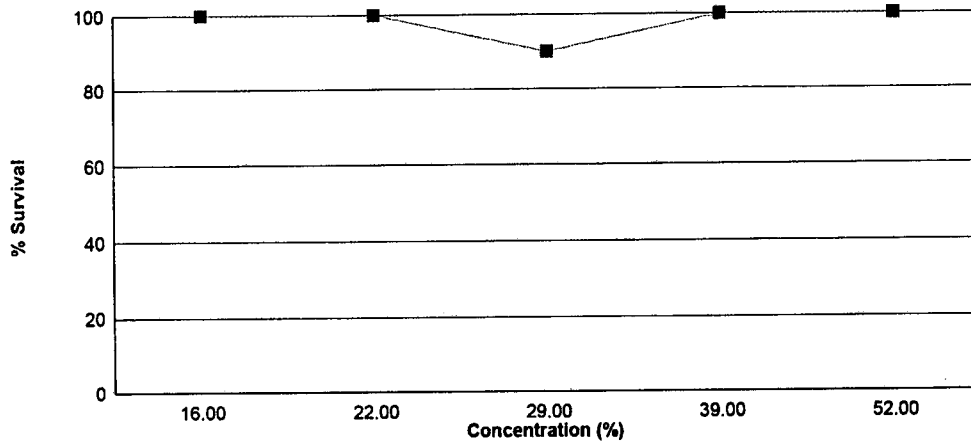
Neonates are exposed in a static renewal system to different concentrations of effluent with dilution water until 60% of surviving control organisms have three broods of offspring with an average of at least 15 young per female.

Effluent dilutions for this test were 16 %, 22 %, 29 %, 39 %, 52 % in accordance with the NPDES permit.

The low flow or 'critical' dilution is specified in the NPDES permit as 39 % effluent.

The test was initiated on March 5, 2013 at 1600 and continued through March 12, 2013 at 1515. Statistical analyses were performed on the observed data and the no observable effects concentrations (NOECs) were as follows:

- a.) NOEC survival = 52 % effluent
- b.) NOEC reproduction = 52 % effluent



Concentration	Percent Survival	Mean Reproduction
Control	100	15.8
16 %	100	18.2
22 %	100	17.0
29 %	90.0	14.6
39 %	100	18.9
52 %	100	18.0

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Survival

 Date and Time Test Initiated: March 5, 2013 at 1530
 Date and Time Test Terminated: March 12, 2013 at 1330

Concentration	Replicate	Number of Survivors						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
16 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	7	7	7	7	7	7
22 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
29 %	A	8	8	8	8	7	7	7
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
39 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	7	7	7	7	7	7
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8
52 %	A	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8

Appendix A1: Test 1000.0

Pimephales promelas (Fathead Minnow) 7-Day Growth

Test Initiated: March 5, 2013 at 1530
Test Terminated: March 12, 2013 at 1330

Drying Started: March 11, 2013 at 1300
Drying Ended: March 13, 2013 at 1200

Concentration	Replicate	Weight of pan	Weight of pan + fish	Total weight of fish (g)	Original # of fish	Mean dry weight (mg)
Control	A	.93008	.93335	0.00327	8	0.409
	B	.93626	.93934	0.00308	8	0.385
	C	.93192	.93449	0.00257	8	0.321
	D	.93098	.93398	0.00300	8	0.375
	E	.92991	.93257	0.00266	8	0.332
16 %	A	.93494	.93840	0.00346	8	0.432
	B	.93505	.93821	0.00316	8	0.395
	C	.93252	.93588	0.00336	8	0.420
	D	.93120	.93466	0.00346	8	0.432
	E	.93172	.93437	0.00265	8	0.331
22 %	A	.93368	.93680	0.00312	8	0.390
	B	.93299	.93640	0.00341	8	0.426
	C	.93237	.93562	0.00325	8	0.406
	D	.93556	.93880	0.00324	8	0.405
	E	.93446	.93789	0.00343	8	0.429
29 %	A	.93347	.93645	0.00298	8	0.372
	B	.93475	.93817	0.00342	8	0.428
	C	.93444	.93754	0.00310	8	0.388
	D	.93497	.93860	0.00363	8	0.454
	E	.93472	.93785	0.00313	8	0.391
39 %	A	.93470	.93793	0.00323	8	0.404
	B	.93400	.93699	0.00299	8	0.374
	C	.93672	.93937	0.00265	8	0.331
	D	.93747	.94086	0.00339	8	0.424
	E	.93784	.94114	0.00330	8	0.412
52 %	A	.93116	.93427	0.00311	8	0.389
	B	.93079	.93420	0.00341	8	0.426
	C	.92902	.93214	0.00312	8	0.390
	D	.92944	.93279	0.00335	8	0.419
	E	.92957	.93290	0.00333	8	0.416

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: March 5, 2013 at 1600

Date and Time Test Terminated: March 12, 2013 at 1515

Concentration: Control														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
4	2	2	3	2	2	2	3	2	2	2	22	10	2.20	
5	4	5	0	4	4	5	4	4	5	5	40	10	4.00	
6	0	0	0	0	0	3	0	0	0	0	3	10	0.300	
7	12	13	9	10	9	0	9	12	10	9	93	10	9.30	
8														
TOTAL	18	20	12	16	15	10	16	18	17	16	158	10	15.8	

Concentration: 16 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	2	2	3	2	2	2	4	2	2	23	10	2.30	
5	7	6	8	8	7	7	5	7	6	7	68	10	6.80	
6	0	0	0	0	5	0	5	0	4	2	16	10	1.60	
7	12	10	9	8	0	9	10E	12	8	7	75	10	7.50	
8														
TOTAL	21	18	19	19	14	18	12	23	20	18	182	10	18.2	

E = Excluded fourth brood neonates

Concentration: 22 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	3	2	3	2	2	3	3	2	3	2	25	10	2.50	
5	8	6	7	6	6	7	8	6	7	6	67	10	6.70	
6	5	4	4	4	0	0	6	0	0	0	23	10	2.30	
7	9E	10E	4	5	9	10	0	9	10	8	55	10	5.50	
8														
TOTAL	16	12	18	17	17	20	17	17	20	16	170	10	17.0	

E = Excluded fourth brood neonates

Appendix A1: Test 1002.0

Ceriodaphnia dubia Survival and Reproduction

Date and Time Test Initiated: March 5, 2013 at 1600
Date and Time Test Terminated: March 12, 2013 at 1515

Concentration: 29 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
2	0	0	0	0	0	0	0	0	0	0	0	0	10	0.00
3	X	0	0	0	0	0	0	0	0	0	0	0	9	0.00
4	X	2	3	3	2	2	2	3	2	2	21	9	2.33	
5	X	8	8	6	7	5	7	7	7	6	61	9	6.78	
6	X	0	3	3	0	2	4	0	4	0	16	9	1.78	
7	X	10	0	0	9	8	10E	12	10E	9	48	9	5.33	
8														
TOTAL	0	20	14	12	18	17	13	22	13	17	146	10	14.6	

E = Excluded fourth brood neonates

Concentration: 39 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	2	3	2	3	2	3	3	3	2	25	10	2.50	
5	6	5	7	7	8	7	8	8	6	7	69	10	6.90	
6	0	0	2	0	2	0	0	0	5	3	12	10	1.20	
7	12	10	9	10	9	8	7	10	8	10E	83	10	8.30	
8														
TOTAL	20	17	21	19	22	17	18	21	22	12	189	10	18.9	

E = Excluded fourth brood neonates

Concentration: 52 %														
Day	Replicate										No. of Young	No. of Adults	Young per Adult	
	1	2	3	4	5	6	7	8	9	10				
1	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
2	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
3	0	0	0	0	0	0	0	0	0	0	0	10	0.00	
4	2	2	2	3	3	2	3	3	2	3	25	10	2.50	
5	7	6	7	7	6	7	6	8	7	5	66	10	6.60	
6	4	0	3	2	3	2	5	0	3	2	24	10	2.40	
7	10E	12	10E	9	8	7	9	12	11E	8	65	10	6.50	
8														
TOTAL	13	20	12	21	20	18	23	23	12	18	180	10	18.0	

E = Excluded fourth brood neonates

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Transformation of Data			Transform: Arc Sin(Square Root(Y))	
Group	Identification	Rep	Value	Transformed
1	Control	1	1.00000	1.39310
1	Control	2	1.00000	1.39310
1	Control	3	1.00000	1.39310
1	Control	4	1.00000	1.39310
1	Control	5	1.00000	1.39310
2	16 %	1	1.00000	1.39310
2	16 %	2	1.00000	1.39310
2	16 %	3	1.00000	1.39310
2	16 %	4	1.00000	1.39310
2	16 %	5	0.87500	1.20940
3	22 %	1	1.00000	1.39310
3	22 %	2	1.00000	1.39310
3	22 %	3	1.00000	1.39310
3	22 %	4	1.00000	1.39310
3	22 %	5	1.00000	1.39310
4	29 %	1	0.87500	1.20940
4	29 %	2	1.00000	1.39310
4	29 %	3	1.00000	1.39310
4	29 %	4	1.00000	1.39310
4	29 %	5	1.00000	1.39310
5	39 %	1	1.00000	1.39310
5	39 %	2	1.00000	1.39310
5	39 %	3	0.87500	1.20940
5	39 %	4	1.00000	1.39310
5	39 %	5	1.00000	1.39310
6	52 %	1	1.00000	1.39310
6	52 %	2	1.00000	1.39310
6	52 %	3	1.00000	1.39310
6	52 %	4	1.00000	1.39310
6	52 %	5	1.00000	1.39310

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Survival

Shapiro - Wilk's Test for Normality		Transform: Arc Sin(Square Root(Y))
<p>D = 0.08099 W = 0.5968 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data FAIL normality test (alpha = 0.01).</p>		

Steel's Many-One Rank Test				Transform: Arc Sin(Square Root(Y))	
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control	25.00	16.00	5.00	
2	16 %	27.50	16.00	5.00	
3	22 %	25.00	16.00	5.00	
4	29 %	25.00	16.00	5.00	
5	39 %	27.50	16.00	5.00	
6	52 %	25.00	16.00	5.00	
Critical values are 1 tailed (k=5)					

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

Shapiro - Wilk's Test for Normality	No Transformation
<p>D = 0.02498 W = 0.9569 Critical W = 0.9 (alpha = 0.01, N = 30) Critical W = 0.927 (alpha = 0.05, N = 30)</p> <p>Data PASS normality test (alpha = 0.01).</p>	

Bartlett's Test for Homogeneity of Variance	No Transformation
<p>Calculated B1 statistic = 5.242 Critical B = 15.086 (alpha = 0.01, df = 5)</p> <p>Data PASS B1 homogeneity test at 0.01 level.</p>	

Appendix A2: Statistics

Pimephales promelas (Fathead minnow) Growth

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	0.007832	0.001566	1.504	
Within (Error)	24	0.02498	0.001041		
Total	29	0.03281			
Critical F = 3.9 (alpha = 0.01, df = 5,24)					
2.62 (alpha = 0.05, df = 5,24)					
Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05	
1	Control	0.3644	0.3644			
2	16 %	0.402	0.402	-1.843		
3	22 %	0.4112	0.4112	-2.293		
4	29 %	0.4066	0.4066	-2.068		
5	39 %	0.389	0.389	-1.206		
6	52 %	0.408	0.408	-2.137		
Dunnett's critical value = 2.36 (1 Tailed, alpha = 0.05, df = 5,24)						

Dunnett's Test - Table 2 of 2						No Transformation	
Ho:Control<Treatment							
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control		
1	Control	5					
2	16 %	5	0.04816	13.2	-0.0376		
3	22 %	5	0.04816	13.2	-0.0468		
4	29 %	5	0.04816	13.2	-0.0422		
5	39 %	5	0.04816	13.2	-0.0246		
6	52 %	5	0.04816	13.2	-0.0436		

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
16 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
22 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
29 %	9	1	10
Total	19	1	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 9. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
39 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) (alpha=0.05) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Appendix A2: Statistics

Ceriodaphnia dubia Survival

Fisher's Exact Test			
Identification	Alive	Dead	Total Animals
Control	10	0	10
52 %	10	0	10
Total	20	0	20

Critical Fisher's value (10,10,10) ($\alpha=0.05$) is 6. b value is 10. Since b is greater than 6 there is NO SIGNIFICANT DIFFERENCE between CONTROL and TREATMENT at the 0.05 level.

Summary of Fisher's Exact Test				
Group	Identification	Exposed	Dead	Sig 0.05
0	Control	10	0	
1	16 %	10	0	
2	22 %	10	0	
3	29 %	10	1	
4	39 %	10	0	
5	52 %	10	0	

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Kolmogorov Test for Normality	No Transformation
<p>D = 0.1468 D* = 1.152 Critical D* = 1.035 (alpha = 0.01, N = 60)</p> <p>Data FAIL normality test (alpha = 0.01).</p>	

Steel's Many-One Rank Test					No Transformation
Ho:Control<Treatment					
Group	Identification	Rank Sum	Critical Value	DF	Sig 0.05
1	Control				
2	16 %	130.00	75.00	10.00	
3	22 %	118.50	75.00	10.00	
4	29 %	103.00	75.00	10.00	
5	39 %	136.00	75.00	10.00	
6	52 %	125.00	75.00	10.00	

Critical values are 1 tailed (k=5)

Appendix A2: Statistics

Ceriodaphnia dubia Reproduction

Dunnett's Test for PMSD Calculation (excluding deaths if applicable)

ANOVA Table				No Transformation	
SOURCE	DF	SS	MS	F	
Between	5	72.14	14.43	1.366	
Within (Error)	53	559.7	10.56		
Total	58	631.8			
Critical F = 3.39 (alpha = 0.01, df = 5,53)					
2.39 (alpha = 0.05, df = 5,53)					
Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)					

Dunnett's Test - Table 1 of 2					No Transformation	
Ho:Control<Treatment						
Group	Identification	Transformed Mean	Mean In Original Units	T Stat	Sig 0.05	
1	Control	15.8	15.8			
2	16 %	18.2	18.2	-1.651		
3	22 %	17	17	-0.8257		
4	29 %	16.222	16.222	-0.2826		
5	39 %	18.9	18.9	-2.133		
6	52 %	18	18	-1.514		
Dunnett's critical value = 2.31 (1 Tailed, alpha = 0.05, df [used] = 5,40) (Actual df = 5,53)						
WARNING - Unequal replicate sizes. Critical values assuming equal replicate sizes have been used.						

Dunnett's Test - Table 2 of 2						No Transformation	
Ho:Control<Treatment							
Group	Identification	Num of Reps	Min Sig Diff (In Orig. Units)	% of Control	Difference From Control		
1	Control	10					
2	16 %	10	3.357	21.2	-2.4		
3	22 %	10	3.357	21.2	-1.2		
4	29 %	9	3.449	21.8	-0.422		
5	39 %	10	3.357	21.2	-3.1		
6	52 %	10	3.357	21.2	-2.2		

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

Date and Time Test Initiated: March 5, 2013 at 0925
Date and Time Test Terminated: March 12, 2013 at 1515

Effluent Conc.: Control		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.8	8.1	7.7	8.2	7.8	8.0	8.6
	Final *1	7.7	6.4	5.0	6.7	7.3	7.0	6.7
	Final *2	8.1	8.1	7.8	8.2	7.8	8.4	8.7
pH, units	Initial	8.2	8.0	8.0	8.1	8.1	8.1	8.1
	Final *1	7.9	7.6	7.4	7.7	7.8	7.8	7.6
	Final *2	8.2	8.3	8.2	8.3	8.1	8.2	8.2
Alkalinity, mg CaCO ₃ /l		61	NA	61	NA	57	NA	NA
Hardness, mg CaCO ₃ /l		83	NA	80	NA	80	NA	NA
Conductivity, umhos/cm		280	280	280	280	300	300	300
Res. Chlorine, mg/l		<0.05	NA	<0.05	NA	<0.05	NA	NA

Effluent Conc.: 16 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.3	7.8	7.9	7.7	7.7	7.7	4.9
	Final *1	7.4	6.2	5.7	6.8	7.4	6.7	6.5
	Final *2	8.1	7.8	7.5	8.3	8.1	8.3	8.8
pH, units	Initial	8.1	8.0	8.0	8.0	8.2	7.9	7.8
	Final *1	7.9	7.5	7.5	7.7	7.8	7.7	7.6
	Final *2	8.3	8.5	8.4	8.3	8.2	8.3	8.3

Effluent Conc.: 22 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.8	8.0	7.6	7.8	7.8	7.6	7.6
	Final *1	7.5	6.3	5.6	6.7	7.4	6.7	6.6
	Final *2	8.2	8.1	8.1	8.0	8.1	8.6	9.0
pH, units	Initial	8.1	8.0	7.9	7.9	8.1	7.9	7.8
	Final *1	7.9	7.6	7.5	7.7	7.8	7.7	7.6
	Final *2	8.3	8.4	8.4	8.4	8.2	8.4	8.4

Appendix A3: Water Chemistry

Routine Chemical and Physical Data

 Date and Time Test Initiated: March 5, 2013 at 0925
 Date and Time Test Terminated: March 12, 2013 at 1515

Effluent Conc.: 29 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.7	8.0	7.1	7.8	7.8	7.5	7.6
	Final *1	7.3	6.0	5.5	6.8	7.4	6.9	6.5
	Final *2	7.9	7.9	8.1	8.2	8.1	8.3	8.9
pH, units	Initial	8.1	8.0	7.9	7.9	8.1	7.7	7.7
	Final *1	7.9	7.6	7.5	7.8	7.8	7.7	7.6
	Final *2	8.4	8.4	8.4	8.3	8.1	8.3	8.2

Effluent Conc.: 39 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.8	7.8	7.7	7.6	7.9	7.9	7.5
	Final *1	7.6	6.1	5.7	6.9	7.3	6.8	6.6
	Final *2	8.3	8.1	8.1	8.6	8.3	8.5	9.0
pH, units	Initial	8.1	7.9	7.9	7.8	8.1	7.9	7.6
	Final *1	7.9	7.6	7.5	7.8	7.9	7.7	7.6
	Final *2	8.4	8.5	8.5	8.3	8.1	8.4	8.4
Alkalinity, mg CaCO ₃ /l	63	NA	59	NA	62	NA	NA	
Hardness, mg CaCO ₃ /l	56	NA	57	NA	55	NA	NA	
Conductivity, umhos/cm	270	270	270	270	290	280	280	
Res. Chlorine, mg/l	<0.05	NA	<0.05	NA	<0.05	NA	NA	

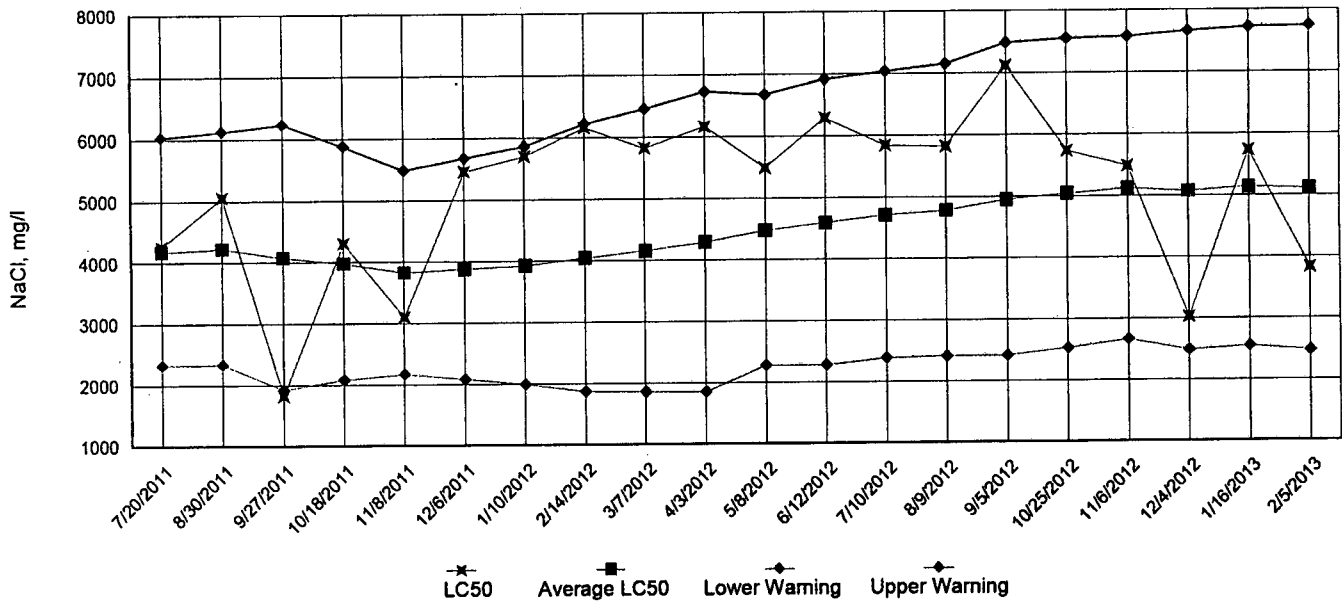
Effluent Conc.: 52 %		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
DO, mg/l	Initial	7.5	7.5	7.3	7.4	7.4	7.1	6.9
	Final *1	7.3	6.0	5.6	6.9	7.4	6.7	6.3
	Final *2	4.3	7.8	7.8	7.8	8.0	8.6	9.0
pH, units	Initial	8.1	7.9	7.8	7.8	7.7	7.7	7.6
	Final *1	7.9	7.6	7.5	7.8	7.9	7.7	7.6
	Final *2	8.1	8.5	8.5	8.4	8.2	8.4	8.5

 *1 = data from the *Pimephales promelas* (Fathead Minnow) test *2 = data from the *Ceriodaphnia dubia* test

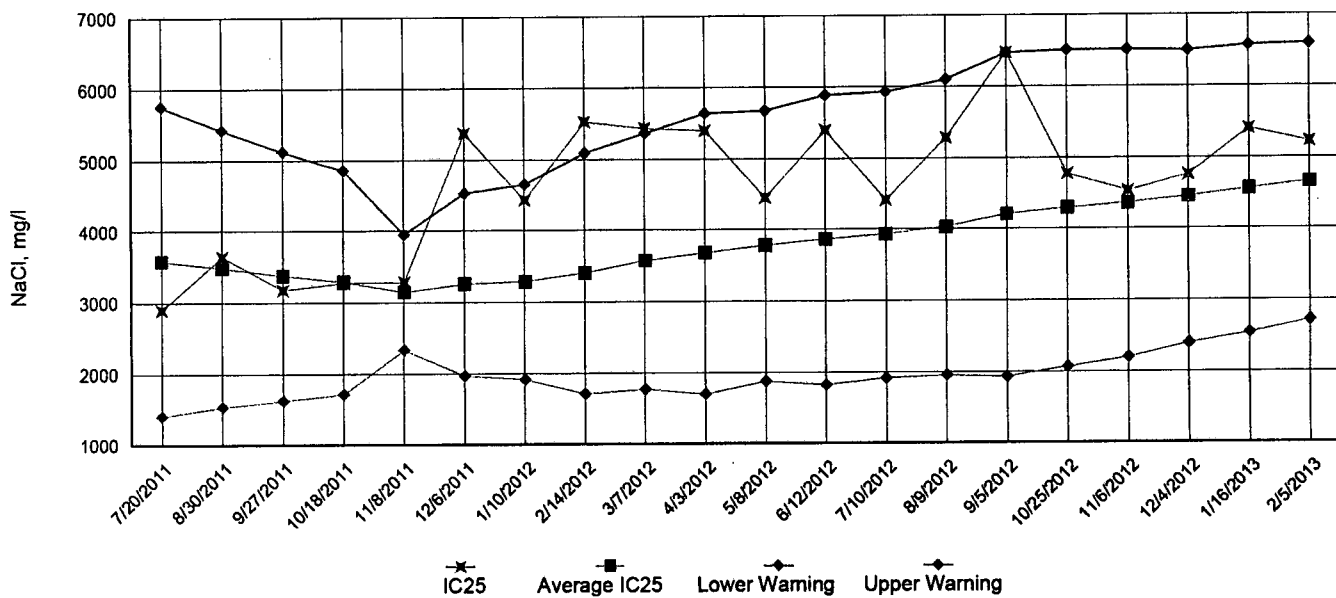
Appendix A4: Test 1000.0

Chronic Reference Toxicant, *Pimephales promelas* (Fathead Minnow)

LC50 Survival Data

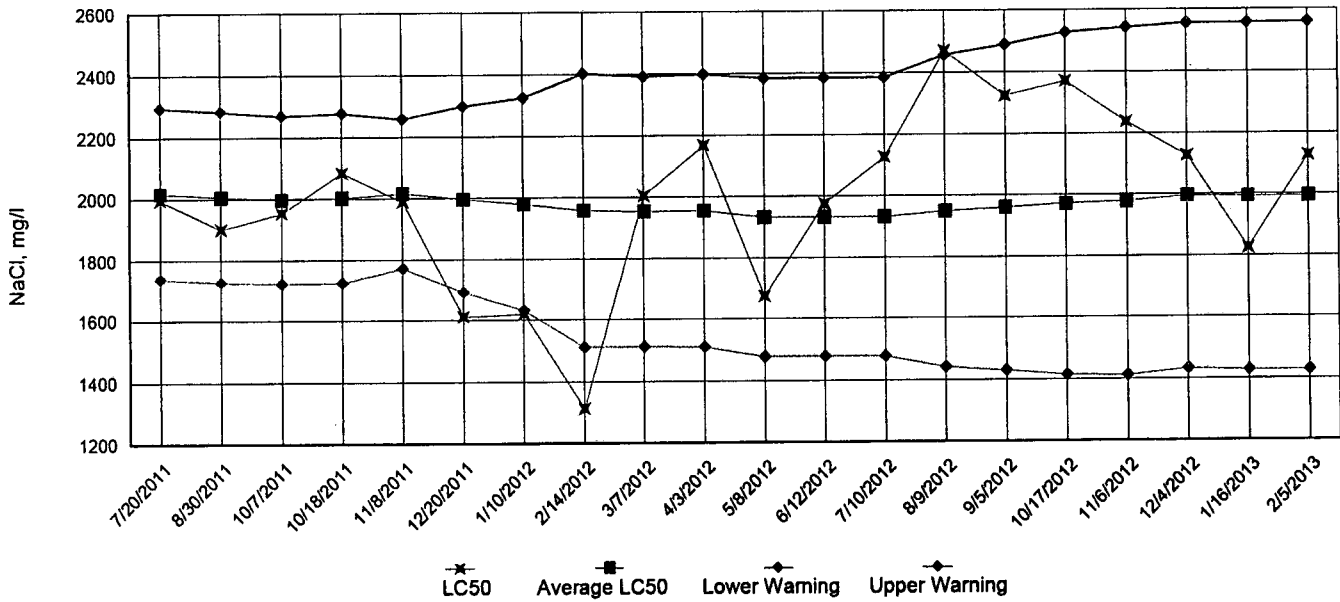


IC25 Growth Data

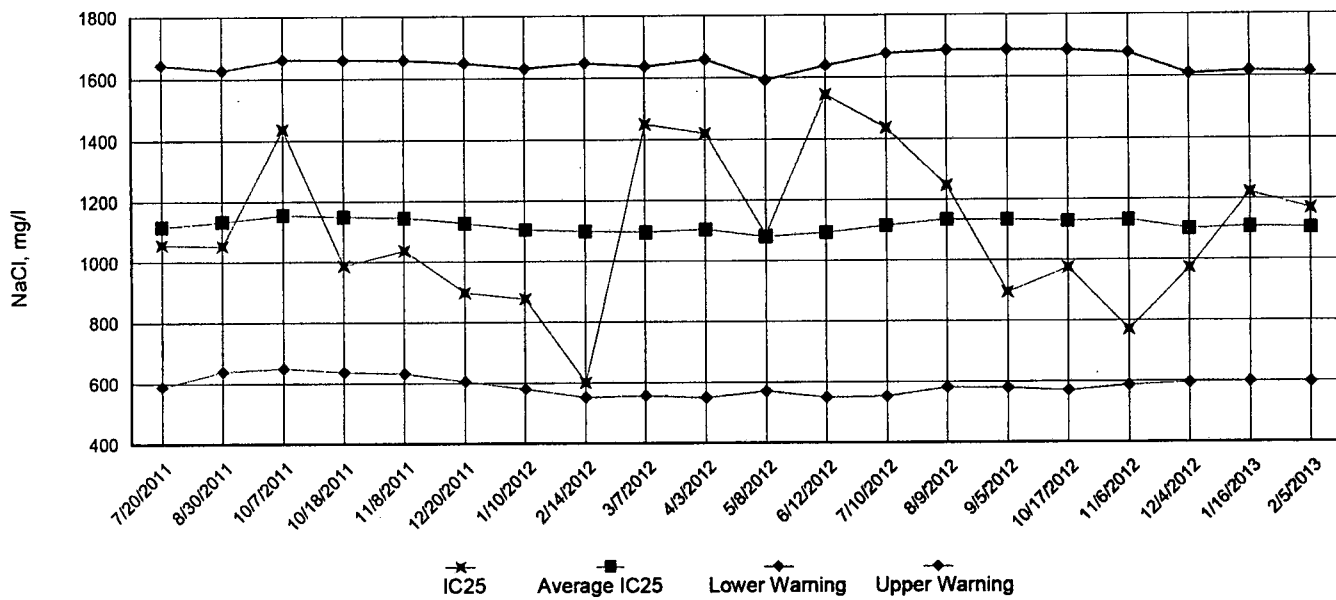


Appendix A4: Test 1002.0
Chronic Reference Toxicant, *Ceriodaphnia dubia*

LC50 Survival Data



IC25 Reproduction Data



Appendix B: Test 1000.0

SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

Permittee: McClelland Consulting Engineers, Inc.

NPDES No.: AR

Date and Time Test Initiated: March 5, 2013 at 1530

Date and Time Test Terminated: March 12, 2013 at 1330

Dilution water used: Synthetic Moderately Hard Water #3965

DATA TABLE FOR SURVIVAL

Effluent Conc. %	Percent Survival in replicate chambers					Mean percent survival			CV%
	A	B	C	D	E	24 hr	48 hr	7 days	
Control	100	100	100	100	100	100	100	100	0.00
16 %	100	100	100	100	87.5	100	97.5	97.5	5.73
22 %	100	100	100	100	100	100	100	100	0.00
29 %	87.5	100	100	100	100	100	100	97.5	5.73
39 %	100	100	87.5	100	100	100	97.5	97.5	5.73
52 %	100	100	100	100	100	100	100	100	0.00

DATA TABLE FOR GROWTH

Effluent Conc. %	Average dry weight, mg replicate chambers					Mean dry weight, mg	CV%
	A	B	C	D	E		
Control	0.409	0.385	0.321	0.375	0.332	0.364	10.1
16 %	0.432	0.395	0.420	0.432	0.331	0.402	10.6
22 %	0.390	0.426	0.406	0.405	0.429	0.411	3.94
29 %	0.372	0.428	0.388	0.454	0.391	0.407	8.24
39 %	0.404	0.374	0.331	0.424	0.412	0.389	9.59
52 %	0.389	0.426	0.390	0.419	0.416	0.408	4.23

CV = Coefficient of variation = standard deviation * 100 / mean

Appendix B: Test 1000.0
SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Pimephales promelas (Fathead Minnow)
SURVIVAL AND GROWTH

1. Steel's Many-One Rank Test:

Is the mean survival significantly different ($p=0.05$) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(39 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

2. Dunnett's Test:

Is the mean dry weight (growth) significantly different ($p=0.05$) than the control's dry weight (growth) for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(39 %)	_____ YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	_____ YES	_____ NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP6C)

4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP6C)

5. NOEC Pimephales Lethality: 52 % (TOP6C)

6. LOEC Pimephales Lethality: 52 % (TXP6C)

7. NOEC Pimephales Sublethality: 52 % (TPP6C)

8. LOEC Pimephales Sublethality: 52 % (TYP6C)

9. Coefficient of variation for Pimephales growth: 10.1 (TQP6C)

Appendix B: Test 1000.0

CHRONIC TOXICITY SUMMARY FORM
Pimephales promelas (Fathead minnow)
CHEMICAL PARAMETERS CHART

PERMITTEE: McClelland Consulting Engineers SAMPLE No. 1 COLLECTED ending: DATE: March 5, 2013 TIME: 0700
 NPDES NO.: AR SAMPLE No. 2 COLLECTED ending: DATE: March 6, 2013 TIME: 0800
 CONTACT: Mr. Bill Miles SAMPLE No. 3 COLLECTED ending: DATE: March 7, 2013 TIME: 0900
 ANALYST: 280, 298, 304, 307 Test Initiated: DATE: March 5, 2013 TIME: 1530
 Test Terminated: DATE: March 12, 2013 TIME: 1330

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	8.1	7.7	8.2	7.8	8.0	8.6
Final	7.7	6.4	5.0	6.7	7.3	7.0	6.7
pH Initial	8.2	8.0	8.0	8.1	8.1	8.1	8.1
Final	7.9	7.6	7.4	7.7	7.8	7.8	7.6
Alkalinity	61	NA	61	NA	57	NA	NA
Hardness	83	NA	80	NA	80	NA	NA
Conductivity	280	280	280	280	300	300	300
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 16 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.3	7.8	7.9	7.7	7.7	7.7	4.9
Final	7.4	6.2	5.7	6.8	7.4	6.7	6.5
pH Initial	8.1	8.0	8.0	8.0	8.2	7.9	7.8
Final	7.9	7.5	7.5	7.7	7.8	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	280	280	280	280	300	290	300
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 22 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	8.0	7.6	7.8	7.8	7.6	7.6
Final	7.5	6.3	5.6	6.7	7.4	6.7	6.6
pH Initial	8.1	8.0	7.9	7.9	8.1	7.9	7.8
Final	7.9	7.6	7.5	7.7	7.8	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	280	280	270	290	290	290
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 29 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	8.0	7.1	7.8	7.8	7.5	7.6
Final	7.3	6.0	5.5	6.8	7.4	6.9	6.5
pH Initial	8.1	8.0	7.9	7.9	8.1	7.7	7.7
Final	7.9	7.6	7.5	7.8	7.8	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	270	280	270	290	290	280
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 39 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.8	7.7	7.6	7.9	7.9	7.5
Final	7.6	6.1	5.7	6.9	7.3	6.8	6.6
pH Initial	8.1	7.9	7.9	7.8	8.1	7.9	7.6
Final	7.9	7.6	7.5	7.8	7.9	7.7	7.6
Alkalinity	63	NA	59	NA	62	NA	NA
Hardness	56	NA	57	NA	55	NA	NA
Conductivity	270	270	270	270	290	280	280
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 52 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.5	7.5	7.3	7.4	7.4	7.1	6.9
Final	7.3	6.0	5.6	6.9	7.4	6.7	6.3
pH Initial	8.1	7.9	7.8	7.8	7.7	7.7	7.6
Final	7.9	7.6	7.5	7.8	7.9	7.7	7.6
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	260	270	270	260	270	280	280
Chlorine	NA	NA	NA	NA	NA	NA	NA

Appendix B: Test 1002.0
SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

Permittee: McClelland Consulting Engineers, Inc.

NPDES No.: AR

Date and Time Test Initiated: March 5, 2013 at 1600

Date and Time Test Terminated: March 12, 2013 at 1515

Dilution water used: Synthetic Moderately Hard Water #3965

PERCENT SURVIVAL

Time of Reading	Control	Percent Effluent				
		16 %	22 %	29 %	39 %	52 %
24 hour	100	100	100	100	100	100
48 hour	100	100	100	100	100	100
7 day	100	100	100	90.0	100	100

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

Replicates	Control	Percent Effluent				
		16 %	22 %	29 %	39 %	52 %
A	18	21	16	0	20	13
B	20	18	12	20	17	20
C	12	19	18	14	21	12
D	16	19	17	12	19	21
E	15	14	17	18	22	20
F	10	18	20	17	17	18
G	16	12	17	13	18	23
H	18	23	17	22	21	23
I	17	20	20	13	22	12
J	16	18	16	17	12	18
Mean per Adult	15.8	18.2	17.0	14.6	18.9	18.0
Mean per Surviving Adult	15.8	18.2	17.0	16.2	18.9	18.0
CV %	18.6	17.5	13.3	21.3	16.3	23.7

CV = Coefficient of variation = standard deviation * 100 / mean
(calculated based on young produced by surviving females)

Appendix B: Test 1002.0
SUMMARY REPORTING FORMS
CHRONIC BIOMONITORING
Ceriodaphnia dubia
SURVIVAL AND REPRODUCTION

1. Fisher's Exact Test:

Is the mean survival significantly different ($p=0.05$) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION	(39 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> NO

2. Steel's Many-One Rank Test:

Is the mean number of young produced per female significantly different ($p=0.05$) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION	(39 %)	<u> </u> YES	<u> X </u> NO
b.) 1/2 LOW FLOW DILUTION	(NA)	<u> </u> YES	<u> </u> NO

3. If you answered NO to 1.a) enter [0] otherwise enter [1]: 0 (TLP3B)
4. If you answered NO to 2.a) enter [0] otherwise enter [1]: 0 (TGP3B)
5. NOEC Ceriodaphnia Lethality: 52 % (TOP3B)
6. LOEC Ceriodaphnia Lethality: 52 % (TXP3B)
7. NOEC Ceriodaphnia Sublethality: 52 % (TPP3B)
8. LOEC Ceriodaphnia Sublethality: 52 % (TYP3B)
9. Coefficient of variation for Ceriodaphnia Reproduction: 18.6 (TQP3B)

Appendix B: Test 1002.0

CHRONIC TOXICITY SUMMARY FORM
Ceriodaphnia dubia
CHEMICAL PARAMETERS CHART

PERMITTEE: McClelland Consulting Engineers SAMPLE No. 1 COLLECTED ending: DATE: March 5, 2013 TIME: 0700
 NPDES NO.: AR SAMPLE No. 2 COLLECTED ending: DATE: March 6, 2013 TIME: 0800
 CONTACT: Mr. Bill Miles SAMPLE No. 3 COLLECTED ending: DATE: March 7, 2013 TIME: 0900
 ANALYST: 280, 298, 304, 307 Test Initiated: DATE: March 5, 2013 TIME: 1600
 Test Terminated: DATE: March 12, 2013 TIME: 1515

DILUTION Control	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	8.1	7.7	8.2	7.8	8.0	8.6
Final	8.1	8.1	7.8	8.2	7.8	8.4	8.7
pH Initial	8.2	8.0	8.0	8.1	8.1	8.1	8.1
Final	8.2	8.3	8.2	8.3	8.1	8.2	8.2
Alkalinity	61	NA	61	NA	57	NA	NA
Hardness	83	NA	80	NA	80	NA	NA
Conductivity	280	280	280	280	300	300	300
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 16 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.3	7.8	7.9	7.7	7.7	7.7	4.9
Final	8.1	7.8	7.5	8.3	8.1	8.3	8.8
pH Initial	8.1	8.0	8.0	8.0	8.2	7.9	7.8
Final	8.3	8.5	8.4	8.3	8.2	8.3	8.3
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	280	280	280	280	300	290	300
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 22 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	8.0	7.6	7.8	7.8	7.6	7.6
Final	8.2	8.1	8.1	8.0	8.1	8.6	9.0
pH Initial	8.1	8.0	7.9	7.9	8.1	7.9	7.8
Final	8.3	8.4	8.4	8.4	8.2	8.4	8.4
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	280	280	270	290	290	290
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 29 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.7	8.0	7.1	7.8	7.8	7.5	7.6
Final	7.9	7.9	8.1	8.2	8.1	8.3	8.9
pH Initial	8.1	8.0	7.9	7.9	8.1	7.7	7.7
Final	8.4	8.4	8.4	8.3	8.1	8.3	8.2
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	270	270	280	270	290	290	280
Chlorine	NA	NA	NA	NA	NA	NA	NA

DILUTION 39 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.8	7.8	7.7	7.6	7.9	7.9	7.5
Final	8.3	8.1	8.1	8.6	8.3	8.5	9.0
pH Initial	8.1	7.9	7.9	7.8	8.1	7.9	7.6
Final	8.4	8.5	8.5	8.3	8.1	8.4	8.4
Alkalinity	63	NA	59	NA	62	NA	NA
Hardness	56	NA	57	NA	55	NA	NA
Conductivity	270	270	270	270	290	280	280
Chlorine	<0.05	NA	<0.05	NA	<0.05	NA	NA

DILUTION 52 %	DAY						
	1	2	3	4	5	6	7
D.O. Initial	7.5	7.5	7.3	7.4	7.4	7.1	6.9
Final	4.3	7.8	7.8	7.8	8.0	8.6	9.0
pH Initial	8.1	7.9	7.8	7.8	7.7	7.7	7.6
Final	8.1	8.5	8.5	8.4	8.2	8.4	8.5
Alkalinity	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	NA	NA	NA	NA	NA
Conductivity	260	270	270	260	270	280	280
Chlorine	NA	NA	NA	NA	NA	NA	NA



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

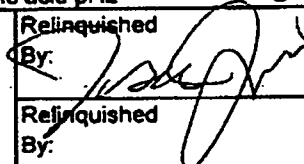
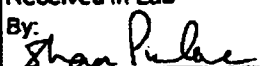
PAGE OF

Client: <u>107CE</u>			PO No.		NO OF BOTTLES	ANALYSES REQUESTED ¹										AIC CONTROL NO: <u>165442</u>						
Project Reference:			SAMPLE MATRIX			3											AIC PROPOSAL NO:					
Project Manager:			WATER SOIL														Carrier/Tracking No. _____					
Sampled By: <u>JESSE JAMES</u>			G R A B	C O M P	W A T E R	S O I L	NO OF BOTTLES											Received Temperature C <u>3.1</u>				
AIC No.	Sample Identification	Date/Time Collected																Remarks				
<u>1</u>	<u>Dumps</u>	<u>3/4/13-3/5/13</u> <u>717A</u>	<u>X</u>	<u>X</u>			<u>3</u>															
																			Field pH calibration on _____ @ _____ Buffer:			
			Container Type																			
			Preservative																			
			G = Glass NO = none		P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate Z = Zinc acetate											
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: <u>[Signature]</u>			Date/Time <u>3/5/13 1410</u>			Received By: _____			Date/Time								
Expedited results requested by: _____					Relinquished By: _____			Date/Time			Received in Lab By: <u>[Signature]</u>			Date/Time <u>3.5.13 1410</u>								
Who should AIC contact with questions: _____					Comments:																	
Phone: _____ Fax: _____																						
Report Attention to:																						
Report Address to:																						

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

165442

PAGE OF

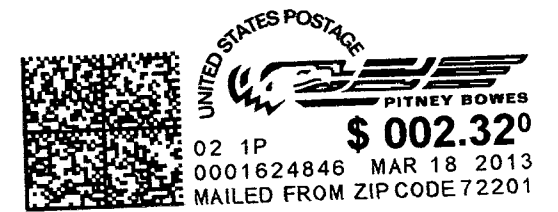
Client: MCE			PO No.		NO OF BOTTLES Bio Day 2	ANALYSES REQUESTED ¹										AIC CONTROL NO: 165404(GEHI77)								
Project Reference:			SAMPLE MATRIX													AIC PROPOSAL NO:								
Project Manager:			WATER SOIL													Carrier/Tracking No.:								
Sampled By: JESSE JAMES			GRA COMP													Received Temperature C 3.1								
AIC No.	Sample Identification	Date/Time Collected	G	A	C	O	M	P	W	A	T	E	R	S	O	I	L	Remarks						
2	Dumps Day 2	3/5/13 - 3/6/13 9A 8P																						
			Container Type												Field pH calibration on @ Buffer:									
			Preservative																					
			G = Glass NO = none		P = Plastic S = Sulfuric acid pH2		V = VOA vials N = Nitric acid pH2		H = HCl to pH2 B = NaOH to pH12		T = Sodium Thiosulfate Z = Zinc acetate													
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS					Relinquished By: 		Date/Time 3/6/13 15:15		Received By:						Date/Time									
Expedited results requested by: _____					Relinquished By:		Date/Time		Received in Lab By: 						Date/Time 3-6-13 1915									
Who should AIC contact with questions: _____					Comments:																			
Phone: _____ Fax: _____																								
Report Attention to: Report Address to:																								



CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: <u>MCE</u>			PO No.		NO OF BOTTLES <u>Bio Dags</u>	ANALYSES REQUESTED ¹										AIC CONTROL NO: <u>165442</u>			
Project Reference:			SAMPLE MATRIX													AIC PROPOSAL NO:			
Project Manager:			WATER SOIL													Carrier/Tracking No. _____			
Sampled By: <u>JESSE JAMES</u>			G R A B	C O M P	A T E R	S O I L	NO OF BOTTLES <u>3</u>											Received Temperature C <u>3.1</u>	
AIC No.	Sample Identification	Date/Time Collected																Remarks	
<u>3</u>	<u>Dumas</u>	<u>3/6/13-3/7/13 9A-9A</u>		<u>X</u>	<u>X</u>														
												Field pH calibration on _____ @ _____ Buffer:							
G = Glass P = Plastic V = VOA vials H = HCl to pH2 T = Sodium Thiosulfate NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate																			
Turnaround Time Requested: (Please circle) NORMAL or EXPEDITED IN _____ DAYS Expedited results requested by: _____ Who should AIC contact with questions: _____ Phone: _____ Fax: _____ Report Attention to: Report Address to:						Relinquished By: <u>[Signature]</u> Date/Time <u>3/7/13 1457</u>		Received By: _____ Date/Time _____											
						Relinquished By: _____ Date/Time _____		Received in Lab By: <u>[Signature]</u> Date/Time <u>3-7-13 1457</u>											
						Comments:													

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